

CHICAGO, MILWAUKEE AND SAINT PAUL RAILWAY 28' BOXCARS

HO-2003 SERIES

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Thank you for choosing Zenith Model Works! We recommend having at least some experience in building model railroad kits before you begin. Refer to sheet 2 for a history of the car, its specifications and lettering schemes. '

IMPORTANT INFORMATION:

Our models are 3D printed in resin. This material is similar to styrene plastic, but it is slightly harder and more brittle. The resin we use responds to ACC, but it will not work with most solvent cements. Unlike traditional resin kits, most of the major components are printed together and very little major assembly is required. Unfortunately, one drawback to resin 3D printing is that sprues used to support the model during the print job are inevitable. At the time of this writing, there is no way to print models without sprues; however, most sprues are easily removed with a fresh X-Acto blade. There may be subtle lumps or deformities in the material where sprues were located; these can be easily sanded or smoothed with contour putty. The resin cures under exposure to UV light. If the model is too soft to work with, place it in a sunny environment for a few days and it will harden. It will become more brittle over time, so use caution. When you receive your model, there may be areas where the resin hasn't fully dried. This residue can usually be wiped away without any significant changes to the quality of the model. 3D printing is a rapidly changing technology and we hope to update our kits as things improve. Thank you for your patience, and as always, thank you for choosing Zenith Model Works. Should anything be missing or broken, please email us at info@3dptrain.com and we will ship replacements at earliest convenience.

RECOMMENDED TOOLS:

Read the instructions thoroughly before beginning construction. Keep a pencil and/or highlighter handy to underscore key details or check off steps. The following tools are necessary to build this kit:

1. Metric ruler or similar measuring device
2. A hobby knife of your choice (a typical X-Acto® knife with a #11 blade works very well)
3. Needle-Nose Pliers
4. Wire Clipper
5. A pin vice
6. #76 and #78 drill bits
7. Flathead or Phillips screwdriver depending on your choice of bolster screw
8. Tweezers
9. ACC

It will help to have some familiarity with standard freight car features. You can add as much or as little detail as you like; feel free to omit certain steps or make modifications where you feel necessary.

Preparation:

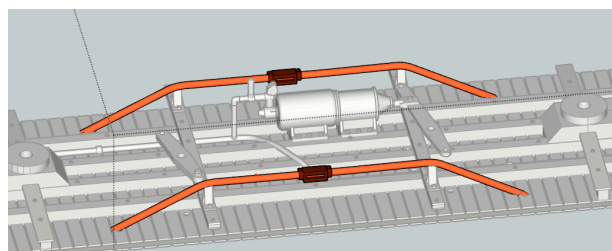
1. If your kit feels soft, allow it to cure in a sunny window for around 24 hours before beginning. This may make assembly easier and the model will take paint better if properly cured.
2. Start by removing sprue marks and cleaning any uncured resin off the model. A small amount of rubbing alcohol and a paper towel usually works very well.
3. Drill out the bolsters to accept a screw of your choice. This location is marked by a small hole included in the print. We recommend a self-tapping 2-56 machine screw, although drilling the hole out first will always help.

Body Details:

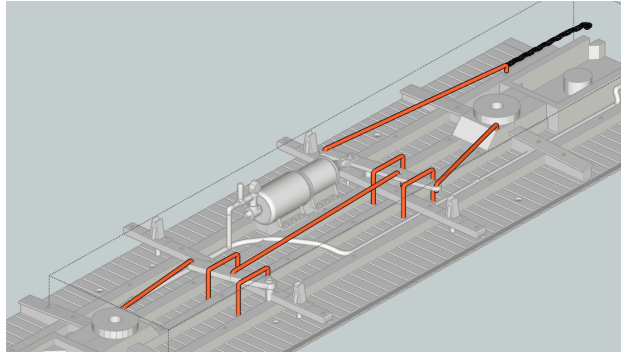
4. Start by drilling out the holes for the grab irons on either side of the car with a #79 drill bit. In addition there were two grab irons mounted on the roof on each end. Use caution when drilling these holes out. It may help to drill inwards at a slight angle as opposed to straight down. Insert the grab irons supplied in the kit into the holes, so that they jut out about four scale inches. Secure them in place from behind with ACC.
5. There was one grab iron located above the ladder on each side of the roof. Drill out the holes and install with ACC.
6. Cars that received safety appliances after 1893 received two end grabs (version C). Later on, some cars had their ends reinforced and received an additional grab iron in the center of each end. Drill out the holes and install from behind with ACC.
7. The door handle can be fastened from a small piece of wire. Locate the holes in the door, drill them out and install the handle. Secure from behind with ACC.
8. If you are modeling a car with air brakes, locate the retainer valve near the roof on the B end. Bend a piece of wire to match the diagram shown and secure it to the valve, running vertically down, and terminating beneath the end sill. Secure with ACC.
9. If you are modeling a car with knuckle couplers, add the cut levers. Locate and drill out the two holes on each end. Bend a piece of wire to match the diagram shown. Slide two eyebolts onto this piece, insert their ends into the holes and secure from behind with ACC.
10. Drill out the ratchet located on the roof of the B end and install a piece of wire to serve as the brake staff. Ensure it stands about 2 feet off the roofline. Glue the brake wheel to the top of the staff. Secure the base of the staff to the bracket below the end sill with a small amount of ACC.

Underbody Details:

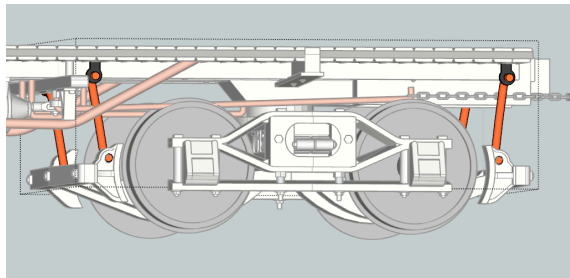
11. Drill out the bolsters using a 2-56 drill. Thread the holes using the 2-56 screws included in the kit. Ensure they are straight.
12. Add weights of your choice. Per NMRA guidelines, the car should way somewhere around 3 ounces. Secure them to the top of the floor with epoxy. Allow 24 hours to cure.
13. Drill out the holes in the underbody for the truss rods. Tie a knot at one end of the filament supplied in the kit. Add turnbuckles if you are modeling a later version of this car. Thread the filament through the holes ensuring it rests on the queen posts. Secure the filament in place with ACC. Ensure the turnbuckles are centered, and secure them in place as well.



14. Versions A and B did not have air brakes. For C and D, bend and install pieces of wire between the brake levers to simulate linkage - see the diagram below. You can cut a turnbuckle in half to represent a clevis for added detail. We included a few extra for this.
15. There would have been a chain running from the hand brake to the main lever. We omitted this to reduce cost, but feel free to add this feature for extra detail.
16. **Brake Lever Hangers:** Drill out the holes located adjacent to the brake levers. There would have been two hangers jutting out from the underbody to prevent the levers from falling. Use a few grab irons to recreate this detail. Secure them in the holes with ACC. See diagram below.



17. **Brake beam hangers:** these cars had body-hung brake beams. Replicating the hangers is difficult and may cause issues during operation. If you wish to add them, see the diagram below. We supplied eye bolts for this. Bend pieces of wire about 2 feet in length with the tips curved to connect the hangers with the brake shoes. The holes in the brake shoes may need to be drilled out. If so, be very careful and use a #79 drill bit.



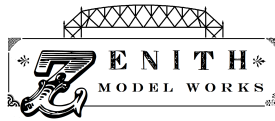
Painting and Final Adjustments:

18. Prepare the completed model for painting by washing with detergent to remove any skin oils. Allow the car to fully dry before applying paint.
19. Paint the underbody first, and then the roof and sides.
20. Refer to the history sheet for details on paint colors. Paint the model using paints of your choice. Allow to fully dry. I recommend you paint the trucks separately from the rest of the model.
21. Decals adhere best to a glossy surface. Gloss Coat the car if necessary, then apply our water slide decals with Micro-sol, Solvaset or a similar decal solution. Allow the setting solution to cure (at least 12 hours) before applying a flat finish.
22. Our trucks accept most standard HO scale wheelsets. It is advisable to install the wheels soon after you receive your kit, because the resin will continue to harden over time and may eventually break if strained too much. When fully assembled, test the coupler height. If the couplers are too high, file some material off the bolsters. If they are too low, you can use a washer to raise the height.

23. Congratulations! Your car is complete. For questions or comments, feel free to contact us at info@3dptrain.com. We appreciate your support.

ACKNOWLEDGEMENTS:

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CHICAGO, MILWAUKEE & ST. PAUL RAILWAY 28' BOXCAR

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General History:

Like many railroads in the U.S., the standard box car on the Chicago, Milwaukee & St. Paul Railway was originally 28' long with a capacity of around 27,000 pounds. According to the earliest Official Railway Equipment Register available, dated June 1885, the Milwaukee had a total of 11,218 box cars on the roster. The largest group of cars is listed as series 2-7998 even, with 3,999 cars, in the 28' length category, making up about 35% of the railroad's freight car roster. This is the group I chose for this kit to represent.

I don't know exactly when these cars were built, or who built them. Freight car data from the 19th century can be difficult to come by, but here's what I was able to find. An 1880 issue of *Engineering: A Weekly Journal* shows the following passage: "The Ohio Falls Car Works have secured a contract to build 400 freight cars for the Chicago, Milwaukee & St. Paul Road. This company has within three weeks contracted for 2,500 new cars, and during the summer it will make contracts for many more, to be placed on its new extension as they progress." The railroad's 18th annual report for the year 1881 indicates "over the past year, 1,850 box cars have been added." Together, these passages suggest at least 4,750 cars were added between 1879 and 1882. This indicates 42% of the railroad's box car fleet had been built at that time. My educated guess is that series 2-7998, even numbers, were built primarily by Ohio Falls in 1880 or 1881. The Milwaukee was also known for building its own freight cars, and it's possible they built many members of this series themselves. Finally, it's possible many members of this class were built well before 1880.

Lifespan:

These cars led long and healthy service lives. In 1901, 3,018 cars in this series remained in service. By 1910, only 959 remained in service. There were 684 still listed in November 1914, but by January 1915, all were off the roster.

Painting and Physical Attributes:

As delivered, these cars were painted with the initials, "C.M. & St. P", on the left hand side of the carbody with the road number on the right hand side. They were most likely an oxide red. By 1888, "Chicago, Milwaukee & St. Paul" was spelled out in a Roman typeface. Weight data was located on the bottom-left side of the car body, and weight and capacity data were located on

the right. This basic arrangement would continue on Milwaukee Road freight cars for the next two decades with relatively few changes.

These cars were delivered without air brakes. The safety appliance act of 1893 mandated air brakes and knuckle couplers be installed on all cars in national interchange by 1900, so the majority of these cars probably received air brakes during the mid 1890s. If you are building a car without air brakes, be sure to snip off the brake shoes of the truck to be located on the "A" end of the car.

Fleet Statistics:

Series:	Jun 1885	Jun 1895	Feb 1901	Mar 1905	Apr 1910	Nov 1914	Jan 1915
2-7998 Even #'s	3,999 Cars	3,999 Cars	3025 cars	2091 cars	959 cars	684 cars	0 cars